Development of a numerical code for the study of a supersonic planar wake JEAN-PIERRE HICKEY, XIAOHUA WU, Royal Military College of Canada — The fully-developed supersonic planar wake represents a canonical high-speed flow occurring in many aeronautical applications. The goal of the current research program is to perform a high-quality direct numerical simulation in order to thoroughly compare the statistics with classical experimental data and gain a better understanding of the structures present in the far-field of a supersonic planar wake. In order to study this flow a code is under development using a very efficient modified MacCormack-type scheme to solve the governing equation set. The main drawback of this numerical method is the large dispersive errors occurring in regions of sharp gradients which can occur in as shocklets in highly compressible flow. To this effect, a study of the numerical properties of this scheme is done using classical one-dimensional test cases such as the Shu-Osher and the Sod problem. The scheme compares very favorably to typical compressible schemes such as the Pade and Roe solvers but shows a very significant advantage in terms of memory usage and speed.

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